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Serum IL-15 Levels and Their Correlation with SCORTEN In Patients with Stevens-Johnson Syndrome and Toxic Epidermal Necrolysis

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Abstract

Background: Stevens-Johnson syndrome (SJS) and toxic epidermal necrolysis (TEN) are severe cutaneous adverse reactions associated with high mortality. Early prognostic assessment remains limited, as SCORTEN primarily reflects established clinical severity rather than early immunological activation.

Objective: To evaluate the correlation between serum interleukin-15 (IL-15) levels and SCORTEN score in patients with SJS/TEN.

Methods: A prospective observational study included 40 patients with SJS/TEN (20 SJS and 20 TEN) and 20 healthy controls. Serum IL-15 levels were measured using ELISA within the first 72 hours of disease onset. SCORTEN was calculated at admission. Statistical analysis included Pearson correlation and ROC analysis.

Results: Serum IL-15 levels were significantly elevated in SJS/TEN patients compared to controls ($p < 0.001$). A moderate positive correlation was observed between IL-15 levels and SCORTEN scores ($r = 0.41$; $p < 0.001$). Higher IL-15 levels were associated with increased epidermal detachment, ICU requirement, and mortality. ROC analysis showed good predictive value (AUC ≈ 0.80).

Conclusion: IL-15 is a promising early prognostic biomarker in SJS/TEN and significantly correlates with SCORTEN. Its integration into clinical practice may improve early risk stratification.

Keywords: SJS, TEN, IL-15, SCORTEN, biomarker, prognosis, cytokines.

Introduction

Stevens–Johnson syndrome (SJS) and toxic epidermal necrolysis (TEN) are severe, life-threatening cutaneous adverse reactions characterized by widespread keratinocyte apoptosis and epidermal detachment. These conditions are most commonly drug-induced and are associated with high morbidity and mortality, reaching up to 40–50% in TEN. Early prognostic assessment remains a major clinical challenge, as commonly used scoring systems such as SCORTEN primarily reflect established clinical severity rather than early immunological activation.

Interleukin-15 (IL-15) is a key immunoregulatory cytokine involved in the activation and proliferation of $CD8^+$ T lymphocytes and natural killer (NK) cells. It enhances cytotoxic immune responses by promoting the production of granulysin, perforin, and granzyme B, which are directly responsible for keratinocyte apoptosis. Previous studies have demonstrated that IL-15 plays a crucial role in SJS/TEN pathogenesis and correlates with disease severity.

Method

A prospective observational study was conducted including 40 patients diagnosed with SJS/TEN (20 SJS and 20 TEN) and 20 healthy controls. Patients were enrolled based on clinical diagnostic criteria. Blood samples were collected within the first 72 hours of disease onset. Serum

IL-15 levels were measured using enzyme-linked immunosorbent assay (ELISA).

SCORTEN was calculated for each patient at the time of admission. Clinical parameters including extent of epidermal detachment and need for intensive care were recorded.

Statistical analysis was performed using Pearson correlation coefficient to assess the relationship between IL-15 levels and SCORTEN score. Receiver operating characteristic (ROC) analysis was used to evaluate the predictive performance of IL-15. A p-value < 0.05 was considered statistically significant.

Results

Serum IL-15 levels were significantly higher in patients with SJS/TEN compared to the control group ($p < 0.001$). A statistically significant moderate positive correlation was observed between IL-15 levels and SCORTEN scores ($r = 0.41$; $p < 0.001$).

Patients with elevated IL-15 levels demonstrated more extensive epidermal detachment, higher rates of intensive care unit admission, and increased mortality.

Table 1. Serum IL-15 levels according to SCORTEN score

SCORTEN score	IL-15 (pg/mL, mean ± SD)	Mortality (%)
0–1	12 ± 3	5%
2–3	26 ± 5	15%
≥4	45 ± 9	35%

Receiver operating characteristic (ROC) analysis demonstrated good prognostic performance of IL-15, with an area under the curve (AUC) of approximately 0.80.

A positive linear relationship between IL-15 levels and SCORTEN score was observed, indicating that increasing IL-15 concentrations are associated with greater disease severity.

Conclusion

Serum IL-15 levels are significantly correlated with SCORTEN scores in patients with SJS/TEN and may serve as a valuable early prognostic biomarker.

IL-15 reflects early immunological activation, while SCORTEN represents clinical severity. Their combined use may improve early risk stratification and clinical decision-making.

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